Incorporating "The Illuminating Engineer."

Light and Lighting

Official Journal of the Illuminating Engineering Society.

32, Victoria St., London, S.W.1.

Edited by J. STEWART DOW

Telephone: ABBey 5215

Vol. XXXII.—No. 11 **November, 1939** PRICE NINEPENCE Subscription 10/6 per annum, post free

Principal Contents:

	PAGE
Editorial Notes	227
Notes and News	228
Lighting in Wartime .... (I.E.S. Meeting)	230
A.R.P. Fittings to Furnish 0.2 ft.c.	233
A.R.P. Lighting in Paris....	234
Lighting Literature	236
Recent Patents	238
Illuminating Engineering Abroad	240
Where to Buy	242

It Ought To Have Been Done Long Before . . . .

AS these words are written we have been at war for more than two months. The course of events has been different from what many people would have imagined. It could, perhaps, scarcely have been foreseen.

But, making all allowances for unpredictable circumstances, there are many preparations now being made that ought to have been undertaken long, long before.

To illuminating engineers of the future it will surely be a matter for amazement that, even after the darkness had descended upon us, it should be necessary to contrive methods of providing low and even outdoor illuminations inconspicuous from above, to devise masks for headlights, light traps for shops, and screened lighting for railway carriages.

It is, however, a matter for satisfaction that, even before the outbreak of war, the services of the Illuminating Engineering Society in dealing with problems of this nature were offered and accepted.

Lack of imagination in the past has imposed undue haste in solving present problems. Scientific methods are, however, now being brought to bear. Progress may seem slow. Nevertheless, the decision of the Authorities to defer decisions until they can obtain full benefit from expert guidance and research should ultimately be justified.

I.E.S. Meeting in London

By holding its meeting in London on November 14 the Illuminating Engineering Society has successfully broken the ice. In the present circumstances a formal programme is no doubt inadvisable and members in general are so busy that they cannot be expected to attend numerous meetings. The success of this particular evening has shown, however, that occasional gatherings are well worth while, even if the audiences are smaller than in normal times. We hope that something of the kind will also be arranged by the various Local Centres. The meeting facilitated the completion of formal business, such as the presentation of names of applicants for membership. It also provided an opportunity for the induction of the new President, Mr. F. C. Smith, who delivered an address referring, in very general terms, to some of the work that the Society is doing in connection with A.R.P. lighting. It was, of course, impossible to go into detail on some points, but enough was said to show the magnitude of the task and the immense amount of time already put in by members serving on committees. The address was followed by a number of interesting exhibits. The hospitality of the E.L.M.A. Lighting Service Bureau once more proved of signal benefit. Those present must have congratulated themselves on the fact that the Bureau is to carry on, and it was like old times to find Mr. W. J. Jones once more in command. A summary of the proceedings appears on page 230.

The Fellowship Plan

Members of the Society have also received particulars of a Special Meeting to take place on December 5, when the proposals in regard to Fellowship and professional status will be brought before them for approval. The scheme, which has been the subject of frequent reference in recent reports of the Council, involves additions to the By-Laws, and the opportunity has been taken to make various other modifications to bring them up to date. The new draft is being circulated before the meeting. It may seem a somewhat bold step to initiate such an important departure in the present circumstances. On the other hand the matter has been very fully explored for quite a long period and is now ripe for consideration by members as a whole. There is a natural feeling amongst many of them that they would like a decision taken now, rather than deferred until normal conditions return—a somewhat indefinite period. Moreover, it may well be argued that the present circumstances rather enhance than otherwise the value of a hall-mark by which the expert illuminating engineer could be identified. Had such a hall-mark been fully established and recognised before the outbreak of war it might have helped materially to smooth the way for the utilisation, in the national service, of expert knowledge of illumination.

Disability and Discomfort Glare

Our old friends "Disability glare" and "Discomfort glare" have been rather in the foreground recently. We have all had excellent opportunities of judging their effect in the abnormal darkness now prevailing. There is a school of thought that contends that the glare caused by any source of light, or at all events any fairly distant one, depends primarily on the *candlepower* in the direction of the eye, not on the *brightness*. According to this view it would appear to matter little whether or no a bare filament was screened by opal glass, even though the brightness per square inch might be enormously reduced by so doing. The writer must own that this is opposed to his own experience. It has, however, been contended that it is disability glare that depends upon candlepower, and that it is another variety, discomfort glare, which is influenced by brightness. One reason, one suspects, why even highly objectionable glare often does not seem to impair ability to see is the power of the eye to make a special effort when called upon to do so. It is also possible that glare, by causing the pupil aperture to contract and thus serve as the stop of a camera, may sometimes actually improve, for the moment, one's ability to distinguish outlines. Whether it can ever influence favourably one's power of distinguishing light and shade seems much more doubtful. If an object is seen entirely as a silhouette it may not matter even if the contrast is reversed, i.e., if one sees a dark object against a light background instead of the more usual effect of black on white. But if one is concerned with light and shade and the observation of form (in which perception of light and shade is involved), it is undoubtedly a great drawback to have reversed contrast. In such circumstances there is no getting away from the good old rule that the object to be examined should be the brightest thing in the field of view, and any glare from much brighter objects in the vicinity must surely be prejudicial. Definite dazzle involves actual discomfort, but before this stage is reached it also has a disturbing effect on "ease of vision," which is perhaps not quite the same thing as power of perception.

Vertical Illumination in the Streets?

An evacuated reader who has suffered somewhat in the black-out (which appears to become more and more impenetrable as one recedes from the Metropolis) points out that traffic lights, besides fulfilling their primary purpose, are now of material value to pedestrians because of the illumination they afford in a vertical plane. Their utility in this respect would, he suggests, be multiplied if a narrow clear ring were left outside the central red cross—thus giving the pedestrian the benefit of a little white light. The ensuing glare might prove a difficulty, and the direction of emission might not be the best for the purpose. Nevertheless, one cannot help thinking that the principle involved is of some value at the present time.

For some years it has been the general practice to aim at high and even road brightness, achieving visibility by silhouette. Under present conditions, however, this attempt to produce appreciable brightness of the roadway is so restricted as to be almost impracticable and reliance is placed almost entirely on the vertical illumination produced by motor car headlights. We have been reminded that Lt.-Commander Haydn T. Harrison, in a paper read at the meeting of the International Illumination Commission in Geneva in 1924, proposed a method of street-lighting based on the use of fixed stationary headlights mounted at a low level and directing a confined beam along the roadway. It does seem that at the present moment such methods have possibilities, in the sense that they aim at creating a brightness in a vertical rather than a horizontal plane.

It would be necessary to limit very strictly the power and direction of such beams, which should be confined below the horizontal and completely screened from the eyes of users of the road. It is a matter for consideration how widely they could be applied, but they should prove of benefit, even if their use had to be confined to situations where revealing the persons of pedestrians was a matter of special importance.

Road Deaths and the Black-out

In normal times lighting experts have frequently found some difficulty in producing data in proof of their firm belief that better street lighting promotes public safety. The relevant factors are so varied and so numerous that it is usually difficult for deductions to be drawn Analyses of such data as those collected by the National Safety First Association do, however, give a clear indication of the greater hazard involved in driving by night—assessed by some at three or four times the average day hazard.

The abnormal conditions during the present black-out, on the other hand, reveal only too clearly the greater danger involved. It has been stated that in September 1,130 people were killed on the roads of Britain as compared with 554 in the same month last year and 617 for August this year. Figures relating to pedestrians only are even more striking, 437 adults killed in restricted areas as compared with 120 in September last year—nearly four times as many! These are surely remarkable figures when one considers how greatly both the volume of traffic and the number of pedestrians must have decreased.

Researches of the National Safety First Association indicate, as might be expected, that elderly people are the chief sufferers—63 per cent. of victims being more than sixty years of age and 14 per cent. between fifty and sixty. There is sound sense in the grim advice given in one newspaper that the old folks had better remain "the old folks at home."

The relaxation of restrictions in regard to the carrying of torches has doubtless proved of great benefit, but it is evidently a matter of urgency to furnish some degree of lighting in busy areas. It is to be hoped that the experiments now being conducted will lead before long to some relief.

Factory and Workshop Lighting

It will be recalled that a paper on industrial lighting was to have been prepared by Mr. E. W. Murray and Mr. S. J. Patmore for presentation at the Conference arranged by the Industrial Welfare Society in Oxford in September last. Owing to the outbreak of war the Conference was inevitably relinquished. We notice, however, that Mr. Patmore has contributed an article to the Journal of the Industrial Welfare Society in which the importance of good industrial lighting in war time is strongly emphasised. It is pointed out that conditions in factories are abnormal. Roof lights must be displaced by shuttering—preferably of material strong enough to withstand the effects of flying debris. Windows are very commonly treated with black paint or special blinds, but here again shuttering is advantageous in view of the risk of shattering of glass. The effect of all this is to give a somewhat dismal appearance to the interior of factories—though it should be noted that there is no reason why the interior surfaces of the obstructing materials should not be light in colour so that the full benefits of diffuse reflection of light may be obtained. In many cases artificial lighting will be necessary for the whole of the time during which the plant is in operation. Good lighting—even better than that provided under normal conditions—is, therefore, desirable. Another reason for recommending that interior surfaces should be light in tint is that glare from any exposed light sources is liable to be accentuated when walls and ceiling are covered with black material. A final piece of advice is that workers in well-lit buildings should be protected from the sudden contrast involved in going out into dark yards and roads adjacent to factories—either by grading the illumination as exits are approached or by providing some form of light-trap which affords time for the eyes to become partially dark adapted before the external darkness is reached.

Masks for Motor Car Headlights

The treatment of motor car headlights has proved to be one of the most difficult of black-out problems. The original regulations on this subject* have subsequently been amended by an order prescribing the fitting of a mask which ensures (1) no light reaching the ground at a distance nearer to the vehicle than five times the height of the lamp above ground level, (2) no light being cast above the horizontal with the vehicle standing on a level road, and (3) an illumination on a vertical surface 10 ft. from the headlamp not exceeding 2.5 ft.c. The official form of mask consists of a metal plate carrying a metal cylinder. The rear of the cylinder is closed by an opaque material containing three horizontal semi-transparent slits and the end which faces forward contains three horizontal hooded open slits. The result is a diffused beam of light ahead of the car with sufficient lateral illumination to illuminate the kerb. It is intended to be fitted to the offside headlamp. It is possible that certain improvements in the original design may be introduced but we gather that this will not affect the validity of those first issued.

Television in War

Wireless transmission of sound has become a familiar and indispensable element in military operations. How soon will the application of television be possible? It is evident that a televised picture of a bursting shell might be more informative than a verbal description wirelessed from an observing aeroplane. The chief difficulty at present is the complexity and weight of the televising apparatus, which it is difficult to fit into observation aeroplanes. It has been stated, however, that experiments in this direction are being made by the Italian army.

* Light and Lighting, Oct., 1939, p. 214.

War Time Lighting

I.E.S. Meeting at the E.L.M.A. Lighting Service Bureau

Induction of the new President (Mr. F. C. Smith) —Address to I.E.S. Members — Demonstrations of Light Locks—Fittings for Weak Illuminations —Torches and Headlamps under war conditions— Photometric Gauges for measuring Low Brightness —Applications of Fluorescent Effects.

The Illuminating Engineering Society held a meeting—the first since the outbreak of war—at the E.L.M.A. Lighting Service Bureau on November 14.

The meeting served a double purpose in providing an opportunity for the formal induction of the new President, Mr. F. C. Smith, and in enabling the names of a considerable number of new members—approaching 100—to be presented. A considerable proportion of these came from the newly formed sub-centre at Nottingham, whose secretary, Mr. C. S. Caunt, had come up to London for the event.

Some doubt might perhaps have been felt by outsiders as to the expediency of arranging a meeting in the present difficult circumstances. Any such doubts were quickly set at rest. It was perfectly clear from the start that the black-out was not going to be allowed to interfere with the proceedings. Members rolled up in force and the lecture theatre was filled to capacity.

Induction of the New President.

Mr. Percy Good, the retiring President, in opening the proceedings, and inducting Mr. F. C. Smith into office, paid a tribute to the immense amount of useful and conscientious work undertaken by him during recent months, and expressed his complete confidence that the Society would benefit greatly by his guidance during the present troublous period.

Mr. Smith, in responding, recalled that Mr. Good's own term of office had been much disturbed and had been divided into three distinct periods, firstly, when he had visited Australia and New Zealand, where he had furthered the interests of the Society in making contacts with sister societies overseas, secondly, during the "ordinary" period when he had devoted himself with great zeal to the Society's welfare and especially to the conception of "Fellowship," and, thirdly, during the "extraordinary" period since the outbreak of war, when his influence had contributed very greatly towards keeping the Society in being, under circumstances which might well have imperilled its future.

Award to Mr. H. Warren.

At this stage the President delivered to Mr. H. Warren the Leon Gaster Memorial Premium, awarded for his paper on "Research in the Production and Utilisation of Light," read before the Society on February 14, 1939.

The President's Address.

The President then gave a brief address to members in which he referred to the international disturbance which had interrupted the normal tenor of the Society's work. He had hoped, at this opening meeting, to deliver his Presidential Address dealing more particularly with the technical work carried out at the meeting of the International Commission on Illumination in June last. This he still hoped to do. But for the moment he had been asked to say something of the present position of the Society, and the special work it was doing.

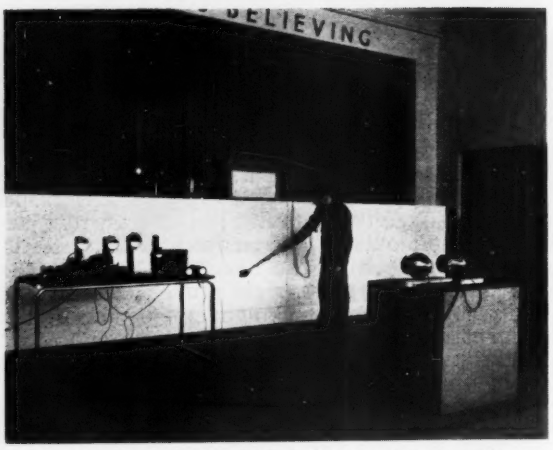


Fig. 1. A Demonstration of Road Vehicle Lighting under war conditions.

Maintenance of the Society's Activities.

The aim of the Council and all members should be to preserve the machinery and financial stability of the Society, which was in a position to render valuable national service, both now and in the period of recuperation which would ultimately arrive. The Society should aim at maintaining the essential activities. It was intended to continue the publication of the Transactions and Light and Lighting. They asked authors to complete papers, so far as possible, which they had undertaken to prepare. The present meeting would be followed by another on December 5 when the new by-laws, involving the scheme of Fellowship and technical status, would be brought before members for their approval. They had in view the arrangement of several other meetings. The Council were also most anxious that everything possible should be done to keep the local centres together. He hoped, in the course of the session, to visit as many of them as he could.

Work in the National Service.

Turning next to the special work of national importance on which many members of the Society had been recently engaged, the President mentioned that even before the outbreak of war the Society had approached the authorities and offered their services, which had been accepted. Whilst he could not be very explicit in referring to certain forms of work undertaken, members would have observed that British standard specifications embodying the work of some I.E.S. committees, such as those dealing with fittings to furnish 0.002, 0.02, and 0.2 ft.c., and with light traps, had already been issued, whilst others, dealing with fluorescent paints and gauges for checking low illuminations, were expected to be available in the near future.

After referring in general terms to other important problems, the President illustrated the complexity of the work by the fact that there were now in existence twenty-three committees on which about eighty members were engaged. Much of the work had necessarily to be done at times when members were usually in bed! He estimated that it had already accounted for quite 2,000 "man-hours."

In conclusion, Mr. Smith paid a tribute to the inspiring leadership of Mr. Good in attacking these various problems, to the efforts of Mr. Dow and his staff, to excellent team work of members engaged on these numerous committees, and to the constant encouragement and assistance which they had received from the authorities concerned.

Gauges for Checking Low Illuminations.

The next item on the programme was one of great interest at the present moment—the design of photometric apparatus to check the very low illuminations

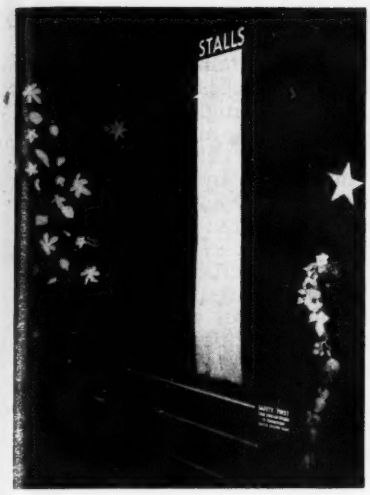


Fig. 2. Effects with Fluorescent Paint. Fabrics and Rhodoid used in a suggestion for Cinemas and Theatres.

Fig. 3. An "Aquarium" of Fluorescent Rhodoid fish, built into a bookcase.

Fig. 4. A corner of the Architectural Room, showing designs in Fluorescent Paint for Box Office and Air Raid Shelter.

now being prescribed, such as the 0.002 ft.c. for which special fittings have been designed.

The need is for some very simple and easily applied device, not requiring manipulation and involving only a single inspection, so as to form a "gauge" rather than a photometer. The gauges shown involve looking through an eyepiece past or through the photometric surface within the instrument at a test-plate illuminated by the illumination to be examined. It should only be necessary for the observer to decide whether or no the latter appears brighter than the former—if it does not then the illumination is passed as not trespassing beyond the minimum allowed.

Two forms of experimental gauges of this nature were shown. Mr. G. E. V. Lambert showed one of a very simple nature utilising a ring of radium luminescent paint through which the test plate is observed. The paint is only weakly excited, so that quite a long period—at least a year—may be expected to elapse before the brightness becomes appreciably affected by the decay of the material.

The second apparatus, demonstrated by Lt.-Col. Kenelm Edgcumbe, is essentially a modification of the Trotter photometer. It utilises a photometric surface, the inclination of which is capable of adjustment, illuminated by a small glow lamp fed from a dry battery. This instrument, intended to serve as a gauge, is provided with three "stops" corresponding with three values of illumination down to 0.0005 ft.c. A second development of the apparatus, intended to serve as a photometer and enabling continuous readings to be made at this low order of illumination and fitted with a voltmeter, etc., was also on view.

It was explained that the gauges were intended to

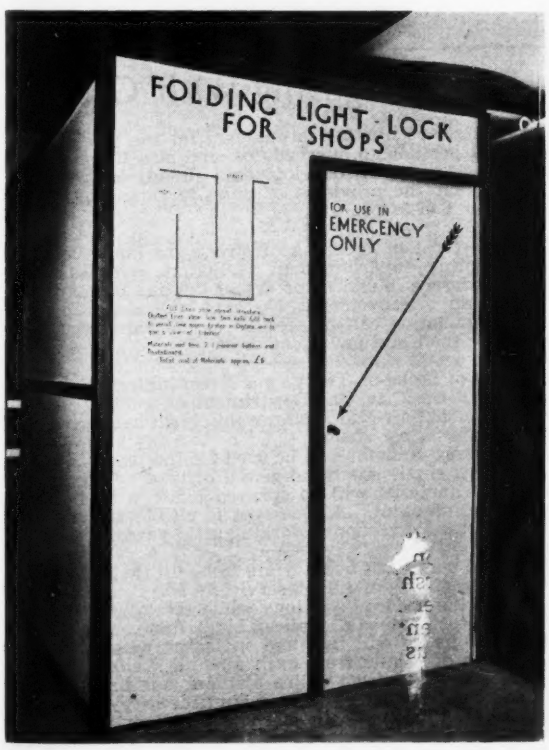


Fig. 5. The Exterior of a Folding Light Lock for Shops, with diagram showing essential principles.

Fig. 6. A view looking through the Folding Light Lock, showing blackened wall with white guide lines.

comply with a British specification, to be issued very shortly.

Fittings to Furnish Low Illuminations.

Mr. W. J. Jones next referred briefly to a series of interesting exhibits. There were on view specimens of the fittings designed to comply with the recently issued British Standard Specifications relating to the provision of 0.002, 0.02, and 0.2 ft.c. Mr. Jones lighted up the electrical types in succession, and called upon Mr. Crawford Sugg to explain the main features of the unit using gas.

Mr. Jones also exhibited a series of small models, which included signs of low brightness, torches giving a diffused light and intended to satisfy present conditions better than those of the conventional type furnishing a highly concentrated beam, and motor-car headlights equipped with the new slit-mask which is now being so widely adopted.

Ultra-Violet Light and Fluorescent Materials.

Mr. Jones referred to the display of fluorescent effects in the architectural room. The architectural studio has been decorated to resemble a cinema or theatre vestibule, and includes many ingenious and attractive effects (Figs. 2, 3, and 4).

One of the great points of fluorescent decoration of this type is its extreme flexibility. The entire decoration could be altered once a week at very little cost. Once the lamps are installed there is no end to the variety of effects to be achieved. Moreover, the fluorescent effects need in no way interfere with the structure of the room.

The whole scheme is operated by four 125-watt black lamps, ar ' consumes only about 10 units of electricity for six hours use. A feature of the display is the skilful positioning of the lamps which are completely hidden from the normal range of view, so that the spectator has an unchecked view of the luminescent devices and is quite unconscious of any " veiling luminous haze " such as is apt to prove distracting when ultra-violet light impinges direct on the eye-lens.

Apart from its high decorative value such vestibule treatment provides the public with a " half way house " which during the day would allow their eyes to make a gradual readjustment before entering the darkened theatre, and at night save them from being plunged from darkness to brightness, and finally, to darkness again when they step into the street.

A single instance of the entertaining possibilities of the medium is the table which has been turned into a fluorescent aquarium (see Fig. 3). Originally, modern in design, it adapted itself admirably to further artistic embellishment and is now an admirable setting for Bureau-born fish and seaweed in a variety of colours. The magnificent red lobster vies only with the revolving surrealist object in the centre of the room. Everything, including the fish, flowers, and leaves, have been constructed in the Bureau by a staff which has not previously handled the practical side of such work, as indeed has been the case with the bulk of the material on show. At a time when economy is bound to be uppermost in the mind of everyone, it is well to remember this point—for what the staff could thus accomplish should not present any insuperable difficulty to others.

Folding Light Locks.

Reference was finally made to the compact and ingenious forms of light-lock on exhibition at the Bureau, which members subsequently had an opportunity of inspecting. Mr. Jones recalled that the object of such light-locks is to enable people to enter or leave brightly lighted interiors at night time without stray light being shed into the street. Their essential features have been summarised in BS/ARP/15. The varieties on view at the Bureau, whilst keeping within the terms of the specification, embody certain special features rendering them acceptable to the public and the shopkeeper (see Figs. 5 and 6).

In the type illustrated, two walls fold back to an inconspicuous position, giving access to the shop and street during the daytime. At night these walls return to their specified positions, making light-proof joints with the frame of the structure. They have, however, been enlivened inside by the introduction of decoration, directional signs and a modicum of advertising all carried out in fluorescent substances actuated by an 80-watt ultra-violet lamp recessed in the ceiling of the main structure. The lock is equipped with a panic door for use in an emergency.

Another lock fitted to the door of the committee room is smaller than that described above and considerably simpler in construction. This again complies with B.S.S. 15, is also fitted with a panic door having a second function of giving easy access during daylight hours. This door also carries a partially obscured glass panel bearing the name and description of the shop. The normal interior lighting should be sufficient to illuminate this sign. The method of obscuring shown reduces the exterior brightness of the sign to a level compatible with restrictions.

As some objection has been raised to light-locks by shopkeepers on the grounds of their ugly appearance, the idea of display backing has been adapted in a number of ways. This interior surface affords the shopkeeper extra display space which can be lighted attractively without any fear of increasing the amount of light liable to penetrate to the street.

The design of a satisfactory light-lock for really small premises has been the subject of much research in the Bureau. The problem was to discover some method of screening the door which would occupy little space, and yet satisfy regulations. A small light-lock has now been constructed round a glass panelled shop door. The glass in the door has been obscured with black paint and a section of the lock constructed with a curtain. This curtain is operated by means of counter weights in such a way that when the door is closed the curtain is drawn back to allow free entrance to the shop interior. As the door opens the curtain is drawn across the entrance space, completely cutting off any light that might otherwise escape into the street.

Public Lighting with Gas

If partial street lighting is put on trial the gas industry will be in a position to offer advice, and also the necessary equipment. Among the developments already known, there is in particular the provision of units for low illumination ranging from 0.002 to 0.2 ft.c.

A system for the screening of street gas lamps, evolved by the Lighting Superintendent at Bolton, is to be tested. The system is not intended for actual lighting of the streets but as an aid to movement. No light will show upwards, but the illumination can be seen 80 to 100 yards away and show where road and pavement meet.

Some 741 of Stoke-on-Trent's gas street lanterns are being converted by the City Gas Department as guiding beacons for the city's 282 air-raid shelters; this is an average of two or three lanterns per shelter.

Existing lamp columns will be used for the lanterns, which will contain a single mantle to give a light of approximately 40 c.p. The lanterns will be sprayed black with a coating of weather-blue paint. A blue spot is visible at a distance of 100 yards; the directional working at 10 yards.

Gas street lamps in Coventry are to be utilised for indicating the whereabouts of A.R.P. services. The glass is painted black, with the letters in yellow, while the symbols are the appropriate colours—e.g., police, blue; first aid, red; etc.

The glass panes will be fitted in lamps within a radius of a quarter of a mile from each air-raid shelter and first-aid post, 200 yards from police stations, auxiliary fire stations, and chief wardens' posts, and outside every police telephone kiosk. The indications show up distinctly both in the day time and at night, the lamps being fitted with a low-powered unit, which at the same time renders them invisible to aircraft.

In the painting of the glass a special process and material impervious to heat and not liable to discoloration have been used.

Methods of Providing Even Illumination of Low Intensity (0.2 Foot-Candles)†

In what follows we give a summary of the above Specification, the third of a series prepared by a Sub-Committee of the Illuminating Engineering Society, and issued by the British Standards Institution at the request of the Air Raid Precautions Department of the Home Office.

Design.—This specification is prepared on similar lines to those previously issued for fittings furnishing 0.002 and 0.2 ft.c.*, and the design is based on the three fundamental conditions that (a) there shall be no light emitted above the horizontal, (b) a reasonably uniform illumination of 0.2 ft.c. shall be maintained at ground level, and (c) fittings shall be capable of inserting in or attaching to existing electric holders or gas fittings.

Main Features.—Any design fulfilling the above conditions may be adopted, but examples of fittings are given below. When installed at heights of 10, 15, and 20 ft. fittings should furnish not more than 20, 45, and 80 c.p. in the direction of the downward vertical.

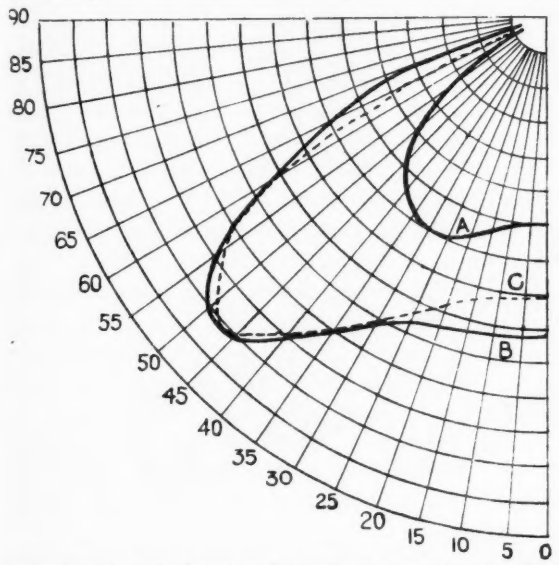


Fig. 1. Limiting and Objective Polar Curve shapes for IES/ARP/0.2 Fittings.

Note.—The polar curves of the fittings should lie within the area enclosed by curves A and B.

For a Spacing/Mounting Height ratio of 2 : 1 lower diversity of illumination will be obtained with a polar curve approximating to the shape of Curve C.

The spacing should not be less than twice the mounting height.

The distribution curve furnished by the fitting should fall within the full line curves shown in Fig. 1. The closer that it approaches to the "ideal curve" ("C," shown dotted) the greater will be the uniformity attained.

Marking of Fittings.—Fittings conforming to the specification may be designated "IES/ARP/0.2." The power of the light source and the corresponding mounting height should be clearly indicated.

Electrical Fitting.—The electric fitting (Fig. 2) consists of a bowl-shaped opaque reflector shielding completely the lamp bulb when viewed horizontally. The lamps used with it are pearl (internally frosted) tungsten lamps, having powers of 15, 25, and 40 watt, corresponding respectively to mounting heights of 10, 15, and 20 ft.

†Published by the British Standards Institution, 28, Victoria Street, London, S.W.1.

*Light and Lighting, Sept., 1939, pp. 186-188.

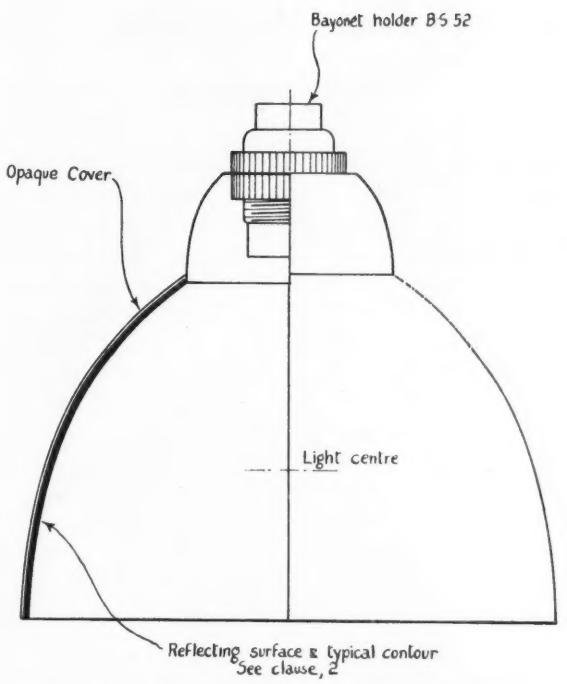


Fig. 2. General Form of IES/ARP/0-2 Electrical Fitting.

Gas Fitting.—This fitting shall consist of a metal shade and cup of the type shown in Fig. 3, the dimensions of the shade and cup and their positions relative to the nozzle being maintained within the tolerances stated. The mantle shall be surrounded by a frosted glass globe. One mantle shall be used in the fitting, the power and size being as follows:—

Mounting Height.	Mantle.	Gas Rate.
10 ft.	Limina	500 B.Th.U. per hr.
15 ft.	*BS$_1$	875 " " " "
20 ft.	*BS$_2$	1,250 " " " "

* British Standard Specification for Low Pressure Gas Mantles, No. 884-1939 (in preparation. The BS$_1$ and BS$_2$ mantles herein specified correspond to those generally known as "Bijou" and "No. 2" or "Cluster" mantles respectively. The dimensions to which the Limina mantle should conform are shown in Fig. 3.

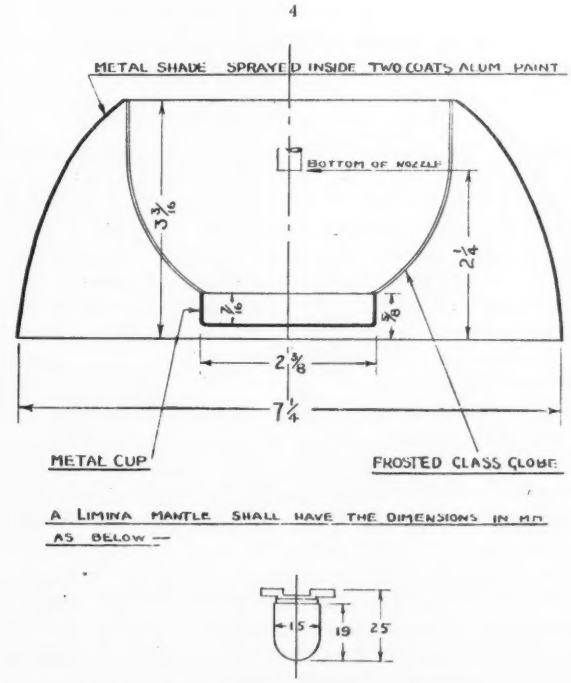


Fig. 3. IES/ARP/0.2 Gas Fitting.

(Dimensions in inches except where otherwise stated.)

A.R.P. Lighting in France

Although, if one may judge from the occasional references to the subject in the Press, the black-out in Paris is not quite so complete as in London, it would appear from articles in "Le Petit Parisien" that precautions in general follow similar lines—that is to say all external lights are forbidden, and the screening of windows and of entrances and exits of all buildings lighted internally is required. Pedestrians are allowed to make use of torches except during an air raid, when they should keep to the pavement so as to leave the road free for vehicles. The headlamp problem has been dealt with by naming three specific types, the adoption of which was compulsory from October 2. In regard to factories, etc., it is emphasised that only complete screening of windows with opaque shutters enable full lighting to be available inside, but it would appear that some relaxation of screening is permitted in certain workrooms in which only one lighting point is used, and where special fittings

Fig. 2. A 5-watt neon lamp, housed in the cup at the base of the fitting, illuminates two curved, grey-tinted reflecting surfaces.

recognised by the authorities (a number of which are identified by name and description) are adopted.

Interesting details of equipment have been given by Mons. J. Maisonneuve in an article in "Lux," from which the accompanying illustrations are taken. In his introductory remarks the author emphasises the necessity, in the present circumstances, of dispensing with the order of illumination which lighting experts believe to be desirable and acquiring the technique of managing with very weak light. Tests have shown that on a very clear night the light of a candle has been seen at a distance of 27 kilometres! Whilst such conditions could hardly conform with those of an aerial observer travelling at perhaps as much as 300 metres per second, the need for care is evident.

A distinction is drawn between lighting for essential purposes which is under full control and is intended to be switched off the moment that warning of a raid is received, and lighting (of very low intensity) which may be kept on permanently. In the case of the former the main consideration is that the light should not form a species of "luminous halo" such as might attract attention from a great distance. Two alternative methods embody the use of numbers of blue lamps of 25, 75, and 150 watts or suitably screened 25-watt lamps.

Conditions applying to lighting which is intended to be kept on permanently and throughout a raid ("Eclairage d'Alerte") are naturally much more exacting. Surfaces thus illuminated should be imperceptible from above at heights of 500 metres (approx. 1,500 ft.). The brightness of exposed surfaces should not exceed 5 10-millionths of a candle per sq. cm.*

Fig. 1. Within the reflector, which is closed by an opal glass base, is a 0.5 watt neon lamp.

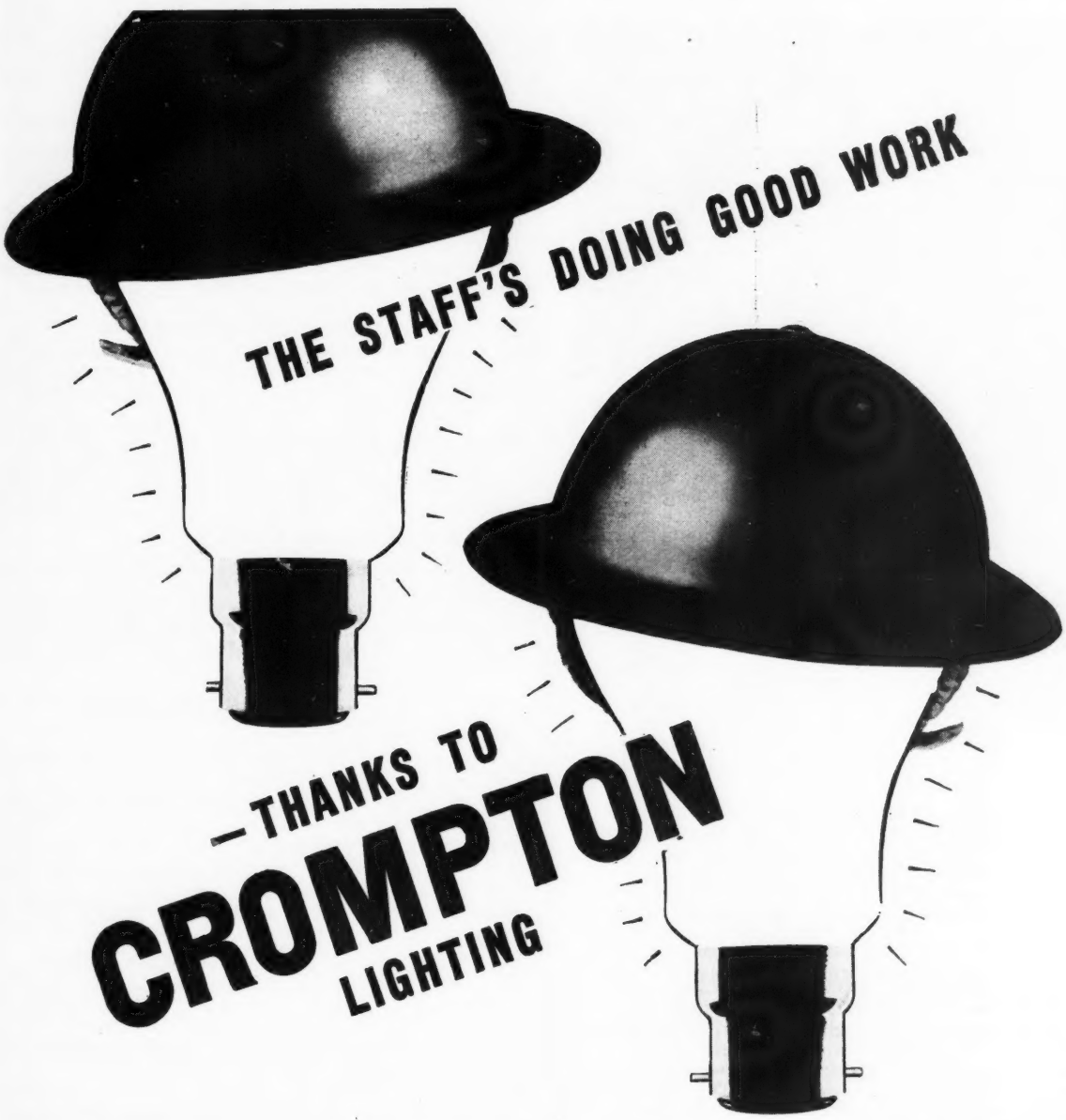
For outdoor illumination the types of fittings using neon lamps and illustrated in Figs. 1 and 2 are mentioned as having received official approval. Fig. 1 consists of a reflector closed by opal glass and containing a 0.5-watt neon lamp. Fig. 2 utilises two grey-tinted surfaces which reflect the light received from a 2-watt neon lamp concealed in the cup at their base.

The other two fittings use incandescent lamps, the bulbs of which are almost completely covered with black enamel, and which are protected by shades so that no light can escape upwards. The fitting illustrated in Fig. 3 utilises a 9-watt lamp terminating in a small translucent area tinted orange. The last fitting (Fig. 4) is somewhat similar but utilises a 25-watt lamp with a blue-screened annulus near its base.

* Roughly equivalent to about 0.00015 ft.c.

Fig. 3. Fig. 4.

The fitting on the left (Fig. 3) utilises a 9-watt incandescent lamp terminating in an orange coloured circle at its lower extremity. The fitting on the right (Fig. 4) uses a 25-watt lamp with a blue annulus. In both cases the remainder of the surface of the bulb is painted with black enamel.



TO keep industrial production up to requirements, adequate lighting is necessary. How to provide this without contravening the Lighting Restriction Order is a matter of some difficulty. That is why so many industrial plants have called for the co-operation of Crompton Lighting experts.

May we send one of our chief technicians to go over your plant with you? He will have in mind two purposes —to plan for more concentrated use of lighting where it is actually needed, and to suggest the most economical methods of using your current.

All the resources of the Crompton Organization have been harnessed to assist you in the present emergency, and the Crompton Lamp Factory is working at full pressure to cope with the new conditions and the demands set up by them.

"Carry on" with

CROMPTON LAMPS

REGISTERED TRADE MARK

CROMPTON PARKINSON, LTD., BUSH HOUSE, LONDON, W.C.2

Telephone: Temple Bar 5911 & 2444 *Telegrams: Crompark, Bush, London.*

Literature on Lighting

(Abstracts of Recent Articles on Illumination and Photometry in the Technical Press)

(Continued from page 212, October, 1939.)

II.—PHOTOMETRY.

273. Photoelectric Photometer for Rapid Comparison of Two Light Sources.

F. A. Ryder, J. T. Gier, and L. M. K. Boelter. Am. Illum. Eng. Soc. Trans., 8, pp. 941-955, September, 1939.

The fundamental criteria for photoelectric flicker photometers are given. These are more exacting than those for the corresponding visual type, and an instrument is described which eliminates certain geometrical errors. J. S. S.

274. Specification Points of Brightness.

H. L. Logan. Am. Illum. Eng. Soc. Trans., 8, pp. 881-906, September, 1939.

Data on the distribution in a variety of naturally lighted fields are given. Criteria deduced from this data are claimed to provide a specification for brightness distribution; some artificially lighted fields are analysed, and the extent to which they satisfy the natural criteria is discussed. J. S. S.

275. An Opacimeter Used in Chemical Analysis.

R. M. Evans and G. P. Silberstein. J. Soc. Mot. Pict. Eng., Vol. XXXII., p. 321, March, 1939.

The opacimeter is designed to measure the light transmission of a coloured or turbid solution. The amount of light transmitted by such a solution is measured photoelectrically. Light from a projector-type lamp passes through a high-aperture lens system and through a flask containing the test solution. The results of analyses are determined from calibration curves prepared from known solutions. R. G. H.

276. A Meter for Germicidal Lamps.

M. Luckiesh and A. H. Taylor. Magazine of Light, VIII., No. 6, p. 5, September, 1939.

A brief description is given of the adaptation of an ordinary photocell photometer to give relative measurement of ultra-violet radiation from ultra-violet sources. C. A. M.

III.—SOURCES OF LIGHT.

277. 1,000-Watt Water-cooled Mercury Lamp.

R. E. Farnham. Magazine of Light, VIII., No. 6, pp. 21-23, September, 1939.

Details are given of a 1,000-w. water-cooled mercury lamp recently developed in America. The water used is recirculated with a pump and radiator. Applications of the lamp include television studio work, photographic reproductions, and searchlights. C. A. M.

278. Mazda Lamps and the Spectrum.

Anon. Magazine of Light, VIII., No. 6, pp. 17-20, September, 1939.

Details are given of the spectral energy distribution of various types of American lamps. C. A. M.

279. Three Germicidal Lamps.

L. C. Porter. Magazine of Light, VIII., No. 6, pp. 15-16, September, 1939.

Details, with a photograph, are given of three new lamps, of American manufacture, of 3-w., 5-w., and 15-w. consumption. These lamps have ultra-violet radiation, which is effective in killing germs. C. A. M.

IV.—LIGHTING EQUIPMENT.

280. Road Traffic Control (Electric) Light Signals. British Standard Specification No. 505—1939.

This is the second revision of this specification, originally prepared in 1931 at the request of the Departmental Committee on Traffic Signs. It covers a wide ground, being divided into six sections in which such matters as optical control, signal construction, control requirements, and controller construction are dealt with. Of special interest are the first two sections, in which the qualities of the coloured glass, the choice of lamps and reflectors and the assembly of the signal head are treated. J. S. D.

281. Lighting Fittings.

Anon. El. Rev., Vol. CXXV., No. 3,228, p. 446, October 6, 1939.

Illustrates, with photographs, a large number of new designs of interior lighting fittings for the home. R. G. H.

282. A.P.L.E. Demonstrations Blacked Out.

Anon. El. Times, 96, pp. 317-319, September 7, 1939.

Descriptions, with illustrations, of equipment which would have been shown at the A.P.L.E. Conference. W. R. S.

283. Opening Doors in the Black-Out.

Anon. El. Times, 96, p. 351, September 21, 1939.

A switch is described which switches off the lighting when a door is opened. W. R. S.

284. A.R.P. Equipment.

Anon. El. Rev., Vol. CXXV., No. 3,230, p. 527, October 20, 1939.

Gives details, and illustrates with photographs, of lighting apparatus designed for black-out purposes. R. G. H.

V.—APPLICATIONS OF LIGHT.

285. Light and Architecture.

Anon. Am. Illum. Eng. Soc. Trans., 8, pp. 848-854, September, 1939.

Some representative architectural lighting schemes are described, with photographs. J. S. S.

286. Lighting in War-Time.

"Pharos." Elect., 123, p. 305, September 29, 1939.

A discussion is given on the adaptation of all lighting, public, industrial, and domestic, to present war-time restrictions. C. A. M.

287. People's Power Erects Model Office Building.

Anon. El. World, 112, p. 594, August 26, 1939.

A description is given of a new office building in which special attention has been paid to modern lighting. Intensities varying from 50 to 300 ft.c. are provided for different purposes. Photographs of the installations and full details are given. S. S. B.

288. An Analysis of Photoelectric Classroom Lighting Control.

D. P. Caverly. Am. Illum. Eng. Soc. Trans., 8, pp. 907-922, September, 1939.

Although photoelectric control of school lighting has been proved satisfactory, high costs have prevented much progress. Specialised equipment and a special charge for electricity are advocated. A description of one successful installation is presented. J. S. S.

289. Modern Lighting Enhances Church Architecture.

Frank H. Jones. El. World, 112, p. 731, September 9, 1939.

Details are given of the special lighting arrangement adopted for a church, by means of which satisfactory visibility is obtained, while the beauty of the architecture is revealed. S. S. B.

290. Los Angeles Terminal.

F. van Gilluwe. Magazine of Light, VIII., No. 6, pp. 10-12, September, 1939.

Details are given of the new lighting equipment both on concourse and platforms at a Los Angeles railway terminus. C. A. M.

291. Lighting Major League Baseball Fields.

R. J. Swackhamer. G.E. Rev., 9, pp. 387-390, September, 1939.

A description is given of equipment producing an average illumination of 100 ft.c. on a baseball field in U.S.A. J. S. S.

292. Sodium Lighting in Salisbury.

Anon. El. Times, 96, p. 279, August 31, 1939.

Some details are given of the newly installed street lighting now in use at Salisbury. Sodium vapour discharge lamps are used, controlled from a central point. The installations now completed are part of a large scheme of improved lighting throughout the city.

S. S. B.

293. Mercury and Tungsten at Margate.

Anon. El. Times, 96, p. 281, August 31, 1939.

A description is given of the electric lighting at Margate, in which some mercury vapour discharge lamps and some tungsten filament units are used. Some of the streets presented special problems.

S. S. B.

294. Luminescent Lamps.

Anon. Magazine of Light, VIII., No. 6, pp. 13-14, September, 1939.

Instances with photographs are given of the use of fluorescent lamps in such widely different uses as the lighting of outer canopies and the lighting of an art gallery.

C. A. M.

295. Garden Lighting.

G. E. Meese and Carl Zersen. Magazine of Light, VIII., No. 6, pp. 26-27, September, 1939.

Garden lighting equipment is discussed with photographs. Fluorescent lamps are recommended.

C. A. M.

296. How New York World's Fair Exhibitors Use Light.

S. G. Hibben. Am. Illum. Eng. Soc. Trans., 8, pp. 855-880, September, 1939.

A description is given of some of the equipment and lighting effects used at the New York World's Fair.

J. S. S.

297. A Waterfall of Light.

Anon. El. Times, 96, p. 228, August 17, 1939.

A description is given of a large electrical sign erected in Leicester-square, London, which is claimed to be one of the largest in existence. It covers 2,000 square feet, using 6,000 feet of fluorescent tubing and nearly 1,000 filament lamps. A special type of controller has been designed to obtain the light variation in the tubes that was desired.

S. S. B.

298. Reproduction of Light.

D. C. Prince and W. K. Rankin. G.E. Rev., 9, pp. 391-393, September, 1939.

The development of a high-speed pinhole camera and its application to the study of circuit-breaker arcs are discussed.

J. S. S.

299. A 120,000 Exposure-per-Second Camera.

"*L. E. C. H.*" Elect., 123, pp. 332-333, October 6, 1939; pp. 347-348, October 13, 1939; pp. 363-364, October 20, 1939.

Modern methods of reproduction of colour in colour film are dealt with in detail.

C. A. M.

SITUATION VACANT

Wanted, Junior Assistant, fittings design. State qualifications, age, and salary required.—Write, Box 362, "Light and Lighting," 32, Victoria-street, London, S.W.1.

The Black-out Abroad

It was reported that following the termination of hostilities in Poland Berlin indulged in a full measure of lighting in celebration of the event. Later the black-out was restored, but this was subsequently modified—because of the tendency of subversive elements to put up placards criticising the authorities under cover of darkness!

The general impression seems to be that in Paris the black-out, whilst certainly strict, is not quite so complete as in London.

LIGHT THROUGH THE AGES

The Linkman

In the days before the advent of street lighting and proper roads, the well-to-do travelled in sedan chairs and employed linkmen who carried torches, made of resinous materials, to light the way.

CRYSELCO LAMPS

CRYSELCO LTD.
KEMPSTON WORKS · BEDFORD
and at BIRMINGHAM, BRIGHTON, CARDIFF, GLASGOW, LEEDS, LEICESTER, LIVERPOOL, MANCHESTER, LONDON

Recent Patents

(Abstracts of recent Patents on Illumination & Photometry.)

No. 510,592. "Improvements in or Relating to Light Responsive Cells."

Radioaktiengesellschaft D. S. Loewe. Dated November 3, 1936. (Convention, Germany.)

This specification describes a photo-electric cell comprising a cathode, an electron-permeable anode, at least one secondary emitting electrode of net-like form mounted between the cathode and anode, and an impermeable secondary emitting electrode mounted on the side of the anode remote from the secondary emitting net-like electrode, in which the cathode, the secondary emitting electrodes, and the anode are arranged concentrically, and the impermeable secondary emitting electrode is adjacent the anode. The specification describes a cell which, with certain applied voltages, gives an output of 1,000 micro-amperes per lumen.

No. 510,594. "Improvements in Road, Warning, Signalling, and like Lamps."

Fuller Accumulator Company (1926), Ltd., and Burt, F. E. Dated January 7, 1939.

This specification describes warning, etc., lamps intended for use at about ground level, particularly during war-time, to give an illumination or warning without light being projected above a certain plane and without forming a pool of light on the ground or casting shadows.

The lamp comprises a light source, a reflector, or lens focusing the light from the source into parallel rays, and a convex, conical reflecting surface in the path of the parallel rays, but not of divergent rays, issuing directly from the source. The conical reflecting surface is adapted to reflect the rays horizontally or downwardly and outwards from the lamp in all directions between a series of horizontal or downwardly dished rings.

No. 510,814. "Improvements in Oil-burning Lamps for Use with Railway, Semaphore, and like Signals."

Lamp Manufacturing and Railway Supplies, Ltd., and Minett, C. F. Dated February 22, 1938.

According to this specification, a lamp of the well-known "long-burning" type comprises a relatively fixed case and a removable interior, the latter including the oil fount, burner, and burner chamber of the lamp. The body of the case and its lid are each constructed of wrought-steel parts welded together, the case body having a main lens and back-light apertures in its front and back, with a portion constituting a lens-holder projecting forwardly around the lens aperture. The back wall of the body has a shape in plan differing materially from that of the front wall, whereby the removable interior, having dimensions and shape in plan complementary to those of the body and equipped with a reflector, may be inserted in the body only with the reflector remote from and opposing the lens.

No. 511,150. "Improvements in Electric Light Fittings."

Adie, K. S. Dated February 11, 1939.

This specification relates to reflector fittings or dispersing units designed for use with mercury discharge lamps in conjunction with gas-filled or other incandescent lamps. According to this specification the mercury discharge lamp is mounted centrally and above a group of three or more incandescent lamps having good, red emission. Reflectors are so disposed that the whole group of lamps lies within the reflectors, and that a large proportion of the light of the discharge lamp reaches the reflecting surfaces after passing through and mingling with the light of the incandescent lamps.

No. 511,306. "Improvements in or Relating to Luminescent Substances and their Preparation."

The Franco-British Electrical Company, Ltd., and Brackensey, A. H. Dated April 13, 1938.

This specification covers luminescent material excitable by the mercury vapour spectrum and consisting of a mixture of manganese activated zinc silicate and manganese activated cadmium silicate.

No. 511,425. "Improvements in the Manufacture of Reflectors."

Robert Bosch, G.m.b.H. Dated, February 24, 1937. (Convention, Germany.)

According to this specification a reflector is coated with an amorphous organic coating which is inherently highly glossy and metal is deposited thereon from metal vapour at low pressure. The organic coating may be stoved lacquer. The metal vapour may be produced by concentrating cathode rays on the metal.

The durability of the metal layer, which may be aluminium, silver, or other metal, may be increased by a coating of quartz vapourised on to the metal.

No. 511,551. "Improvements in Miners' Lamps."

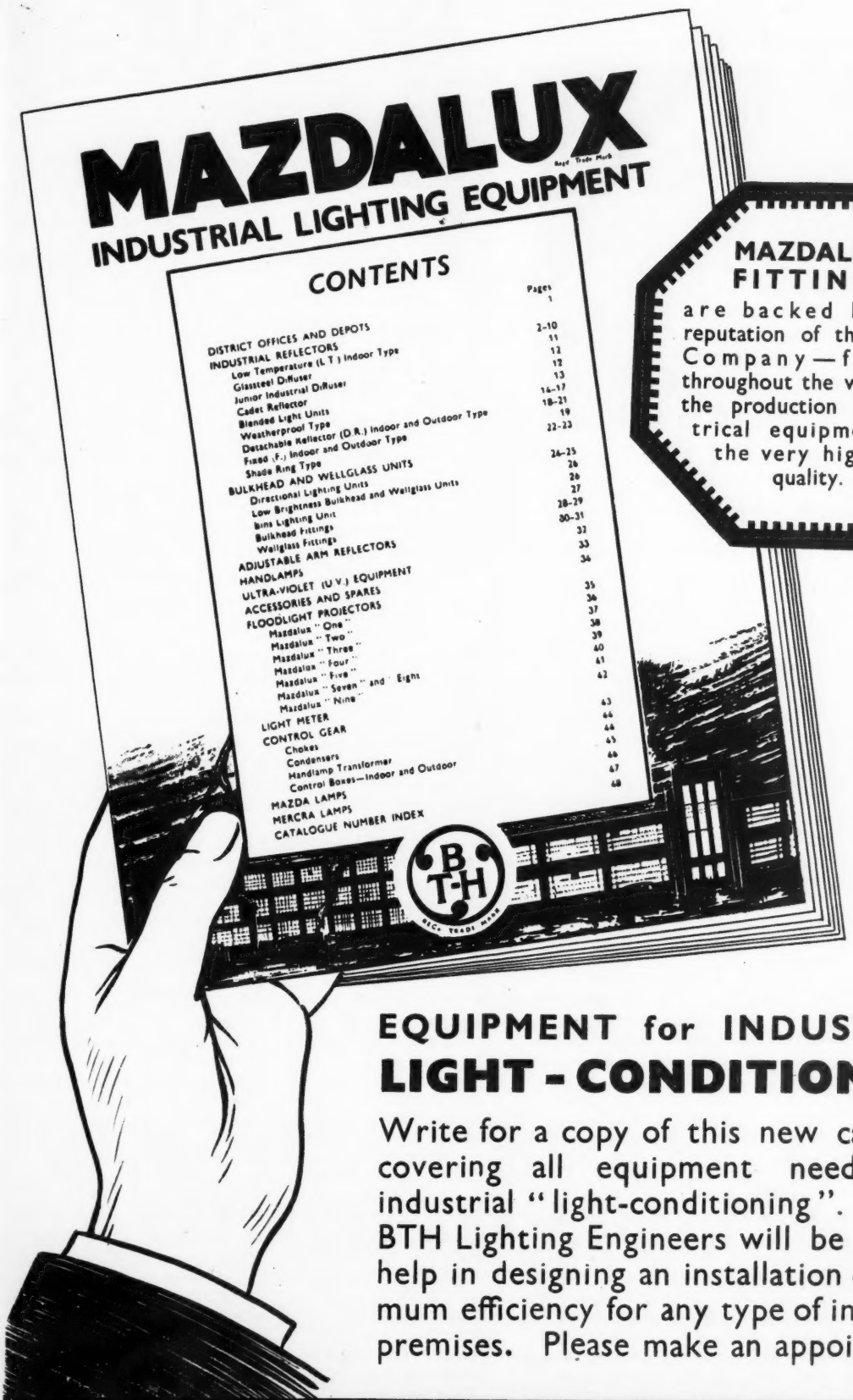
Ceag, Limited, and Plummer, R. J. Dated March 26, 1938.

This specification describes miners' lamps of the kind comprising, in a self-contained unit, a lamp for illumination, a battery, and a gas detector. The gas detector instrument is arranged intermediate the battery casing and a bull's eye lantern. The bull's eye lantern preferably has a bezel ring, rotation of which switches on and off the main lamp. An auxiliary lamp may be provided to illuminate the gas detector.

No. 511,889. "Improvements in Gas-filled Electric Incandescent Lamps."

The General Electric Company, Ltd. (communicated by Patent-Treuhand-Gesellschaft für elektrische Glühlampen m.b.H.). Dated June 2, 1938.

This specification relates especially to gas-filled lamps having a pressure exceeding atmospheric and operating with the filament at a temperature exceeding 2,700° C. In order to minimise blackening of the envelope a chimney is disposed over the filament and is composed of or carries a metal, such a zirconium, which at its operating temperature (which preferably exceeds 500° C.) reacts with oxidising gases to form a compound stable at that temperature.



MAZDALUX FITTINGS

are backed by the reputation of the BTH Company—famous throughout the world for the production of electrical equipment of the very highest quality.

EQUIPMENT for INDUSTRIAL LIGHT-CONDITIONING

Write for a copy of this new catalogue covering all equipment needed for industrial "light-conditioning".
BTH Lighting Engineers will be glad to help in designing an installation of maximum efficiency for any type of industrial premises. Please make an appointment.

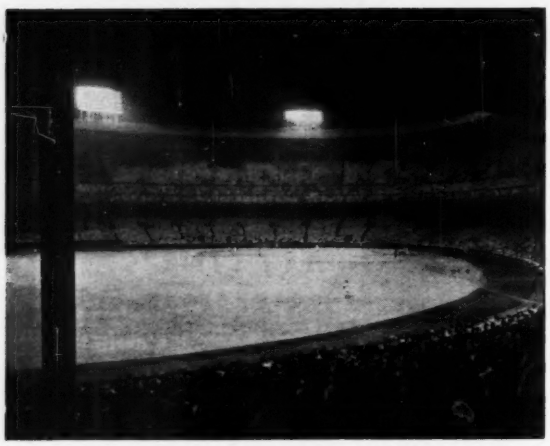
THE BRITISH THOMSON-HOUSTON CO., LTD., CROWN HOUSE, ALDWYCH, LONDON, W.C.2.

M 3844

NOTES ON ILLUMINATING ENGINEERING ABROAD

(Specially Contributed—H. L. J.)

United States of America.



We reproduce above a view of the baseball field at Cleveland, U.S.A., one of three similar floodlighting installations completed this year for league contests. Over 100 ft.c. is provided over the area of the playing field. Such installations are proving a great commercial success and are constantly increasing in number.

The "Magazine of Light" gives complete data of a new type of germicidal lamp which has recently been introduced. The U.V. radiation is most effective and particularly strong on the line 2537 Å. Natural sunlight is not exceptionally rich on that line, but more in the longer U.V. regions, i.e., 2800-3200 Å. These lamps are very effective as sterilisers, but it is recommended that they should be so installed that they do not radiate into the human eye. Places recommended for their use include operating theatres, cupboards and drawers for medical instruments. Their efficiency is in some degree dependent on the room temperature. The lamps are supplied in 3, 5, and 15-watt types, the overall length ranging from 5⅜" to 17 25-32". The 5-watt type can be operated direct on 110-125 volts and the 3 and 15-watt types on the same voltage but with auxiliaries. The nominal U.V. output for the 15-watt is 20-25 micro-watt per sq. cm. of 2537 Å. radiation at 1 metre; for the 5-watt, 1 micro-watt, and for the 3-watt, 6 micro-watt.

Experiments have proved that the 15-watt type installed in an air duct (of non-U.V. reflecting metal) is capable of sterilising 150-200 c.ft. of air per minute.

A material with good reflecting power for ultra-violet is chemically etched aluminium. This re-directs 76%. Bacilli coli are killed at an intensity of 6,600 micro-watt seconds per sq. cm. if adhering to moist surface and with 1,500 micro-watt seconds per sq. cm. if suspended in the air.

Australia.

Mr. E. Brown presented a paper to the Illuminating Engineering Society, Australia (N.S.W. Section), which has been reprinted in the Society's official organ, "The Australasian Engineer." In reviewing research work on phenomena in connection with glare the author distinguishes three main varieties. The first of these is the so-called "veiling glare," which occurs when a bright beam, for instance, of sunlight, is interposed between the object and the observer's eye. If the eye is subjected to such conditions for long periods harm may result, although at the time the individual may not be conscious of any degree of discomfort. "Contrast" or "dazzle" glare is the second form explained, and is the more serious in its effects. If the eye is exposed to it for appreciable periods discomfort is caused, and the efficiency for any seeing task is reduced. Such glare is created by bright sunlight, or by naked lamps of high candle power, by the location of light sources in the field of view, and by undue brightness contrast between light sources and background. It may also be created by alternating changes between high and low brightness falling within the field of vision. The most serious form is the so-called "blinding" or scotomatic glare which gives rise to after images, and may give rise to a considerable period of absolute blindness.

Methods of measuring glare have been developed, particularly by Messrs. Luckiesh and Holliday. The apparatus used consists of a screen illuminated at a given brightness, a lamp shielded from the observer's eye to illuminate the screen, and a second lamp directed towards the observer's eye and arranged so that the angle between the line of vision (between the observer's eye and the object placed on the screen) can be varied. By using such apparatus it is found that if the screen illumination is increased by the second lamp the apparent size of the object may be reduced. If the angle formed by the dazzle source and the line of vision is increased the effect of the dazzle source decreases progressively. Beyond 40° glare effects become negligible by reason of the natural protection afforded by eyebrows.

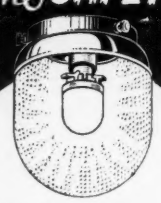
The author acknowledges British studies and action regarding glare, making particular mention of Specification No. 307, 1927, and No. 324, 1934, also of the investigations made by Dr. W. F. Stiles at the National Physical Laboratory and of Dr. Walsh's investigations on glare caused by headlights on vehicles.

France.

M. M. P. Juget, in a contribution to the *Bulletin de la Société Française des Electriciens*, discusses modern lighting provisions in picture galleries. He emphasises the importance of good diffusion of light on the pictures themselves, and remarks that so far no universally applicable solution has been found. Other important problems are the reproduction of true-colour effects, by means of some sort of artificial daylight or colour combinations, and the question of adequate distribution of light, which, in several, is not satisfactory. Experience has proved that after dark visitors prefer to be themselves in a zone less illuminated than that in which the picture itself exists. It is, however, desirable to have a certain even illumination all over the room. Some divergence of opinion seems to exist regarding the illumination to be produced on the picture surface.

M. Juget then proceeds to discuss actual installations and to compare the data available. He makes a distinction between three main methods, the first involving lighting provided by a laylight, the second utilising semi-direct devices incorporated in the architecture of the room, and the third making use of independent direct lighting fittings. In all twelve different art galleries are compared. It is interesting to note that all but three utilise laylights. Installations, which are considered satisfactory by the respective managements, vary quite considerably in regard to the illumination produced and the wattage provided per square metre of wall space. The following are instances of such variations: In the Musee Boyman the illumination is 9 ft.c. and the consumption 100-125 w.; in the French gallery corresponding values are 6.3-7.2 ft.c. and 36-70 w.; in the Swiss gallery about 2.7 ft.c. and 20 w.; in the British galleries, the National Gallery, for instance, approx. 4.5 ft.c. and 15 w.; while for the Butler Art Institute no figure is given. Values of illumination in a horizontal plane are, in general, about 30 per cent. less.

The SAFETY-FIRST Gas Globes



P.A.L. Unbreakable GAS GLOBES

P.A.L. Gas Globes cannot break—they save mantles—prevent risk of fire.
Ideal for Institutions, Works and Offices, etc.
Recommended by Fire Insurance Companies

2/6

Obtainable from all factors or from:—
PIFCO, LTD., WATLING ST., MANCHESTER. London Address: 58 CITY ROAD, E.C.1

YES A POWERFUL ROBUST SELF-SUSTAINING WINCH

Hundreds of thousands supplied during the last 35 years to Govt. Depts., Corporations, Railways, innumerable traders, etc., etc. Will not run back. No wheels to get caught in.
Direct Drive and Ratio Types

WINCHES

Smallest wall space, side or front driving: also special types including multi-division barrels, combined horizontal and vertical operation, etc.

The London Electric Firm Croydon

Phone: Uplands 4871/2 (2 lines)

NO RATCHETS, PAWLS, SPRINGS, or GEAR WHEELS

Special Lighting for Historic Room

The Painted Hall at Greenwich

A striking example of modern lighting practice applied to decorations of rare historical interest is furnished by an installation recently carried out in the Painted Hall of the Royal Naval College, Greenwich.

The Painted Hall was designed by Sir Christopher Wren, and its ceilings and walls bear a series of vast emblematical paintings executed by Sir James Thornhill from 1708 to 1727. It has been used as a picture gallery and as a repository for the principal Nelson relics, but is now the officers' mess of the Royal Naval College. The Hall has now been restored practically as Wren designed it and Thornhill decorated it.

The special lighting installation which was carried out by H.M. Office of Works in conjunction with the General Electric Company, Ltd., consists of concealed lighting fittings. These illuminate the painted ceiling indirectly by means of specially designed louvred floodlights, each equipped with 250-watt horizon lamps and mounted on the high window sills. The mural decorations at either end of the Hall are illuminated in a similar way.

As the ceiling has a high specular surface any ordinary indirect lighting would have produced reflections of the lighting fittings, thus spoiling the effect of the paintings.

The G.E.C. also supplied a number of electric food trolleys, made throughout of stainless steel, and of special design, for use at the College.

Ediswan Electric—A New Appointment

Following the resignation of Mr. A. Scott from the managership of the Ediswan Belfast office, Mr. C. W. W. Torrance has been appointed in his place.

A.R.P. Lighting Equipment

It is doubtless true that if one's blacking-out material is opaque enough one can have all the light one needs indoors, and enjoy the same freedom in the selection of high intensity indirect lighting, etc., as in normal times. Yet this is, in fact, a counsel of perfection. The curtains available to the public are usually by no means completely opaque, though they answer well enough provided no direct light is cast upon them. In such circumstances fittings such as the Ediswan type here illustrated prove a great convenience. One can thus get the requisite downward light without unduly illuminating surroundings. The shade is painted matt black inside and outside. Used with 15-25 w. pearl or A.R.P. blue-sprayed lamps, it may be adapted to varied conditions. Another Ediswan unit (Type B) is intended for 15-40 w. lamps, and furnishes a narrow downward white beam with a dim blue glow in lateral directions.

Ediswan A.R.P. Lighting Unit (Type A)

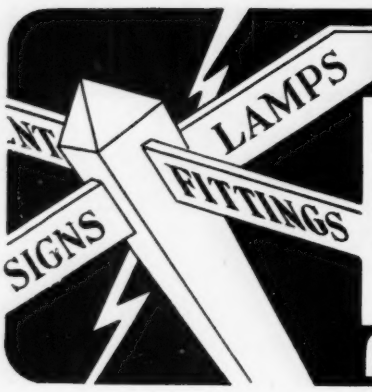
FROM THE NIPHAN (REGD. TRADE MARK) SYSTEM OF COUPLINGS AND PLUGS

SWITCHES AND SWITCH SOCKETS

Standard NIPHAN W.T. Switches and Switch Sockets are available in great variety. The model illustrated is the NIPHAN combined Switch Socket with spring cover and plug. Capacity 5 amp. and 15 amp.—250 v. Case in cast iron with brass fittings

WRITE FOR CATALOGUE 16 C

SIMMONDS & STOKES LTD.
VICTORIA HOUSE, SOUTHAMPTON ROW W.C.I. HOLBORN 8637



WHERE TO BUY

We invite applications for spaces in this new section of the journal. Particulars of terms for each space (approx. 1 inch deep and 3½ inches wide) are given below.

These terms are equivalent to **half our ordinary advertising rates**, but not less than 12 successive monthly insertions can be accepted on this basis, and amounts are payable in advance.

Payment for an advertisement in this section entitles the advertiser to receive *Light and Lighting* during the period of the contract.

Terms:	**12 Successive Monthly Insertions**	**£3 10 0**	}	**Payable**
	24 „ „ „	**£6 0 0**	}	**in**
	36 „ „ „	**£8 10 0**	}	**Advance**

A DIRECTORY OF LIGHTING EQUIPMENT

1

PHOTOMETRIC EQUIPMENT Benches, Cubes, Spheres, Heads, Standards of Light, Special Accessories

Suppliers to H.M. Government, N.P.L., Lamp Manufacturers, etc.

ALEXANDER WRIGHT & CO., LTD.,
WESTMINSTER, S.W.1

2

ALLOM BROTHERS LTD.
16, GROSVENOR PLACE, LONDON, S.W.1.

Specialists in the Science of Modern Lighting, including:

Theatres and Public Halls. Tennis and Racquet Courts.
Pictures and Picture Galleries. Floodlighting, etc.
Decorative Fittings in Glass and Metal.

3

Take no risks—specify **BENJAMIN PLANNED LIGHTING**
THE BENJAMIN ELECTRIC, Ltd., TARIFF ROAD, N.17

4

MAZDA LAMPS, MERCRA LAMPS (B T-H)
and BTH LIGHTING EQUIPMENT
Our Illuminating Engineers will be pleased to advise on any Street, Industrial or Floodlighting problem
THE BRITISH THOMSON-HOUSTON CO., LTD., Crown House, ALDWYCH, W.C.2.

5

SEAMLESS STEEL
LIGHTING STANDARDS
for all requirements
BROMFORD TUBE CO. LTD.
BIRMINGHAM

6

THE REINFORCED CONCRETE LAMP COLUMNS SPECIALISTS:
CONCRETE UTILITIES, Ltd., WARE, Herts.
The Firm with Experience.
Creators of the Popular Avenue Design.

7

Curtis Lighting
COMPANY OF GREAT BRITAIN LIMITED
OFFICES: ALDWYCH HOUSE, LONDON W.C.2. WORKS: PONDERS END, MIDDLESEX.
Manufacturers of **X-Ray Reflectors**

8

DRAKE & GORHAM LTD.
36, GROSVENOR GARDENS, LONDON, S.W.1
and Branches
For all Lighting Problems—Cinemas, Works, Offices, Public Buildings, Country Houses.

9

"ESLA"
BI-MULTI AND MULTIPLANE REFLECTORS
Lanterns, Brackets, Columns, Switches and Fuse Boxes, etc., FOR STREET LIGHTING
The Electric Street Lighting Apparatus Co., The Foundry, Canterbury.

10

VITREOUS ENAMELLING
(CAST and SHEET IRON)
Spun Reflectors, Lamp Casings, Sheet-metal Work, etc.
ELM WORKS LTD. SUMMERSTOWN, LONDON S.W.17. Est. 1903

11

ENGINEERING & LIGHTING EQUIPMENT CO. LTD.
SPHERE WORKS, ST. ALBANS, HERTS.
TELE. 258
DISCHARGE LIGHTING
FITTINGS FOR ALL PURPOSES

12

PHOTOMETERS
PHOTO-ELECTRIC
BENCH, CUBE, STREET and PORTABLE TYPES
FOR CANDLE POWER AND ILLUMINATION TESTS
EVERETT EDGCUMBE Colindale Works, LONDON, N.W.9

13

FLOODLIGHTING & FITTINGS, LTD.
294, GRAY'S INN ROAD, W.C.1.
DESIGNERS AND MANUFACTURERS OF MODERN LIGHTING FITTINGS.
CONSULT US ON ANY DECORATIVE, COMMERCIAL OR FLOODLIGHTING SCHEME.
TEL.: TERMINUS 5954.

MODEL 'B'

14

THE GUNFIRE (Trade Mark)

PIONEERS of AUTOMATIC LIGHTING

GAS CONTROLLERS, ELECTRIC, and SYNCHRONOUS TIME SWITCHES

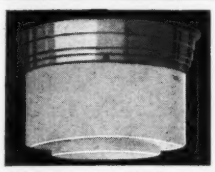
Manufactured by:—
BRITISH, FOREIGN AND COLONIAL AUTOMATIC LIGHT CONTROLLING CO., LTD., BOURNEMOUTH

15

Aldwych House, London, W.C. **G·V·D** *Telephone: Holborn, 7277-8*

FOR BETTER LIGHTING

16



Decorative, Architectural and Commercial Lighting Fittings and Equipment.

Harcourts LIMITED
Stanhope Hse, I Kean St., Aldwych, London, W.C.2.
Telephone: Temple Bar 9671/2/3/4 H.L.50

17

SCIENTIFIC Holophane TRADE MARK **ILLUMINATION**

The Hall-Mark of Good Lighting

18

NEWBRIDGE

GAS CONTROLLERS AND COMETS FOR STREET LIGHTING AND INDUSTRIAL PURPOSES.

Manufactured by:—
THE HORSTMANN GEAR COMPANY, LIMITED,
NEWBRIDGE WORKS——————BATH
'Phone:—7241/2. 'Grams:—Horstmann, Bath.

19

C. H. KEMPTON & Co. LTD., FOR MODERN STREET LIGHTING BY GAS
70-72, BENNERLEY ROAD, S.W.11

20

A.R.P. LIGHTING UNITS
LINOLITE LTD.
100, VICTORIA ST., LONDON, S.W.1
TEL. VIC. 1563

21

MEK-ELEK Engineering Ltd.,
16, Douglas Street, LONDON, S.W.1.
Victoria 5707. Cables: Mekelek, London

22

W. PARKINSON & CO.
FOR MODERN
STREET LIGHTING BY GAS
IRON LANE, STECHFORD, BIRMINGHAM, 9
Tel. No. STECHFORD 2253 : : and at LONDON and BELFAST

23

F. H. PRIDE LTD.
ILLUMINATING ENGINEERS
CINEMA & HOTEL LIGHTING SPECIALISTS
Designers and Manufacturers of Modern Lighting Fitments and Electrical apparatus
69-81, CLAPHAM HIGH ST., S.W.4 Telephone: MACaulay 2281/4.

24

RADIOVISOR PARENT, LTD.
DARNOC HOUSE, 36, ALFRED PLACE, LONDON, W.C.1
LIGHT ACTUATED APPARATUS
CONTROL OF STREET, FACTORY, AND SIGN LIGHTING.
SMOKE INDICATOR AND RECORDER.

25

SIEMENS

ELECTRIC LAMPS of all types. "SIERAY" ELECTRIC DISCHARGE LAMPS. ELECTRIC LIGHT FITTINGS. FLOODLIGHTING APPARATUS. SHOP-WINDOW LIGHTING EQUIPMENT. STORE LIGHTING. INDUSTRIAL LIGHTING, CINEMA LIGHTING, ELECTRIC SIGNS, ETC.

38-39, UPPER THAMES STREET, LONDON, E.C.4

26

REGD TRADE MARK NIPHAN

PLUGS, SOCKETS, TEES, COUPLINGS, TERMINAL SOCKETS AND JOINT BOXES *for every portable and temporary lighting requirement.*

SIMMONDS & STOKES, LTD.
VICTORIA HOUSE, SOUTHAMPTON ROW, LONDON, W.C.1
Phones: (Head Office) Holborn 8637; (Works) Putney 1364

27

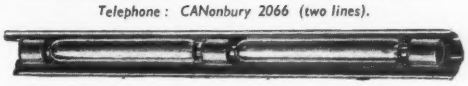
WASK

PATENT SELF SUSTAINING WINCHES
FOR ALL PURPOSES
Quick hoisting with little effort
MADE IN TWO SIZES

Walter Slingsby & Co. Ltd., Keighley
Tel.: Keighley 2367-3749.

28

STRAIGHT-LITE REFLECTORS, LTD.,
73, CANONBURY ROAD, LONDON, N.1.
Telephone: CANonbury 2066 (two lines).



REFLECTORS FOR EVERY PURPOSE

29

STRAND ELECTRIC
AND ENGINEERING Co.LTD.
SPECIALISTS IN COLOUR LIGHTING and STAGE EQUIPMENT
LIGHTING FOR EVERY OCCASION
THEATRES:EXHIBITIONS
FLOODLIGHTING:CINEMAS
BALLROOMS:PAGEANTS
19-24 FLORAL ST. LONDON, W.C.2

30

For every type of GAS LIGHTING

SUGG WESTMINSTER

When you want the best!
CHAPTER ST., S.W.1

31

"THORLUX"
"OVERLAMP" REFLECTORS
DISCHARGE OR GASFILLED LAMPS
SLIP-IT-ON SLIP-IT-OFF OVER THE LAMP FOR CLEANING
F.W. THORPE LTD. 39, BOLTON ROAD, SMALL HEATH, BIRMINGHAM.
FOR EASY MAINTENANCE - THE BEST

32

ULTRALUX AND LOUVERLUX FITTINGS See them at

THE LIGHTING CENTRE LTD

TROUGHTON & YOUNG LTD · KNIGHTSBRIDGE · SW1

33

WARDLE ENGINEERING Co., Ltd.

OLD TRAFFORD, MANCHESTER, 16.

STREET LIGHTING EQUIPMENT. FLOODLIGHT PROJECTORS
WORKSLITE REFLECTORS. WARDELYTE GLASSWARE
PRISMALUX DIRECTIONAL UNITS.

Index to "Where to Buy"

Accessories	26	Local Lighting	21
Architectural Lighting	8, 15, 16, 20, 28, 29, 32	Photo Electric Cells	24
Automatic Light Control	14, 18, 24	Photometers	1, 12
Cinema Lighting	8, 17, 23, 25, 29	Reflectors	7, 9, 10, 19, 20, 28, 31
Concrete Pillars, etc.	6	Signal Lights	33
Electric Lamps	3, 25	Special Lighting	2, 8, 15, 16, 23, 29, 32
Fittings	2, 3, 7, 8, 9, 10, 11, 13, 15, 16, 17, 19, 20, 22, 23, 25, 29, 30, 31, 32, 33	Steel Standards	5
Floodlighting	2, 4, 13, 17, 25, 29, 33	Street Lighting Units	4, 9, 10, 11, 17, 19, 22, 25, 30, 33
Gaslighting	19, 22, 30	Theatre Lighting	2, 17, 29
Glassware	17	Time Switches	14, 18
Industrial Lighting	3, 4, 11, 17, 25, 33	Winches and Suspension Gear	27

N.B.—The numbers are those attached to individual entries in the Directory (See pp. 242—244)

London Electric Winches

Whilst the London Electric Firm has long been known for the variety of work it handles, it is particularly closely identified with searchlights and with its special winches. Hand winches have been manufactured for thirty-five years. They are supplied for all weights up to 10 cwt., the heavier types being constructed on the precision principle, so as to secure the requisite smooth action motion. Types are made for combined horizontal and vertical operation.

A new light-weight improved pattern of winch has a ratio of 1:1 (i.e., one turn of the handle gives one revolution of the barrel) with the result that weights can be raised and lowered at the quickest possible speed and without ratchets, pawls, worm, spur, or gear wheels. In addition to the quick development of power there is a material saving in space occupied.

Such winches are very widely used in Government departments, railways, works, stores, etc., and they have recently found a special application under the new Factory Act for the raising and lowering of racks used for suspending and drying workers' clothes. Such racks are fairly heavy, and winches of 2½ cwt. capacity are commonly used. Pulleys and other accessories for such work are also manufactured.

In addition, these winches are used for blinds, shutters, aeroplane hangers, electric lighting fittings in halls, hotels, etc., dampers, curtains, laundries, steamer lids, hospitals, etc.—in fact, their applications are manifold.

Benjamin Lighting Equipment

An excellent range of special lighting units, some of them very helpful in the present circumstances, is to be found in a new catalogue (No. 1,600) of Benjamin Lighting Equipment. We illustrate herewith two selected devices, the heavy duty vapour proof fitting, for use in industrial installations where there is danger due to explosive dust, and the A.R.P. adaptor which facilitates the reduction of light from large units by the substitution of smaller lamps. To some of the other special units, such as the stock bin unit, the luminescent signs for use in the event of sudden darkness, and others we mean to refer in forthcoming issues.

Benjamin A.R.P. Adaptor

Heavy Duty Vapour Proof Fitting

Catalogues Received

BENJAMIN ELECTRIC, LTD.—Catalogue of Benjamin Lighting Equipment (No. 1,600).

BRITISH THOMSON - HOUSTON COMPANY, LTD.—Complete lamp catalogue, also leaflets with the heading "The Nation's Light."

HOLOPHANE, LTD.—Leaflet featuring special A.R.P. lighting fittings.

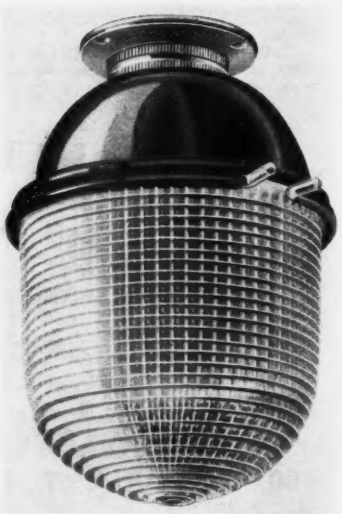
METROPOLITAN - VICKERS ELECTRICAL COMPANY, LTD.—List of Metrovick and Cosmos lamps.

PHILLIPS LAMPS, LTD.—Memorandum describing the application of "Philora" lamps to (a) illumination for ordinary lighting, (b) illumination of premises completely blacked out, so that artificial lighting must be used continuously, (c) illumination with modified black-out (complementary colour sodium lighting), and (d) revealing objects painted with fluorescent material and exposed to ultra-violet rays.

SIEMENS ELECTRIC LAMPS AND SUPPLIES, LTD. — Catalogue of Siemens electric lamps; also list of "Sieray" discharge lamps.

WARDLE ENGINEERING COMPANY, LTD.—Catalogue of Wardle lighting equipment, with introductory notes on the essentials of good lighting; also leaflet illustrating "Prismalux" directional lighting units.

Holophane A.R.P. Fittings



In a recently issued leaflet describing special lighting fittings for A.R.P., Holophane, Ltd., illustrate not only the now familiar fittings for 0.002 and 0.02 ft.c., but also the 0.2 unit (B.S./A.R.P./21), the specification for which has only just been issued. This complies with the requirements in regard to screening of light from above and distribution, and utilises a special prismatic reflector for fitting to any existing B.C. holder. Other units listed include the "Widerlite" for air-raid shelters, etc., and a special well-glass fitting (B.S./A.R.P./6), which is also intended for air-raid shelters and is adapted to the prescribed 12-volt 10-watt (bus type) lamp. This unit is illustrated above.